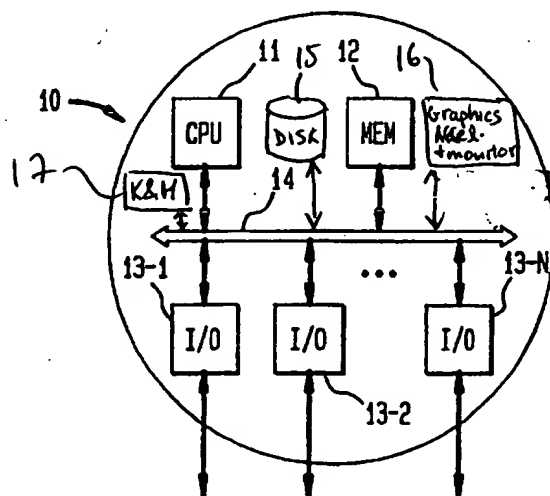
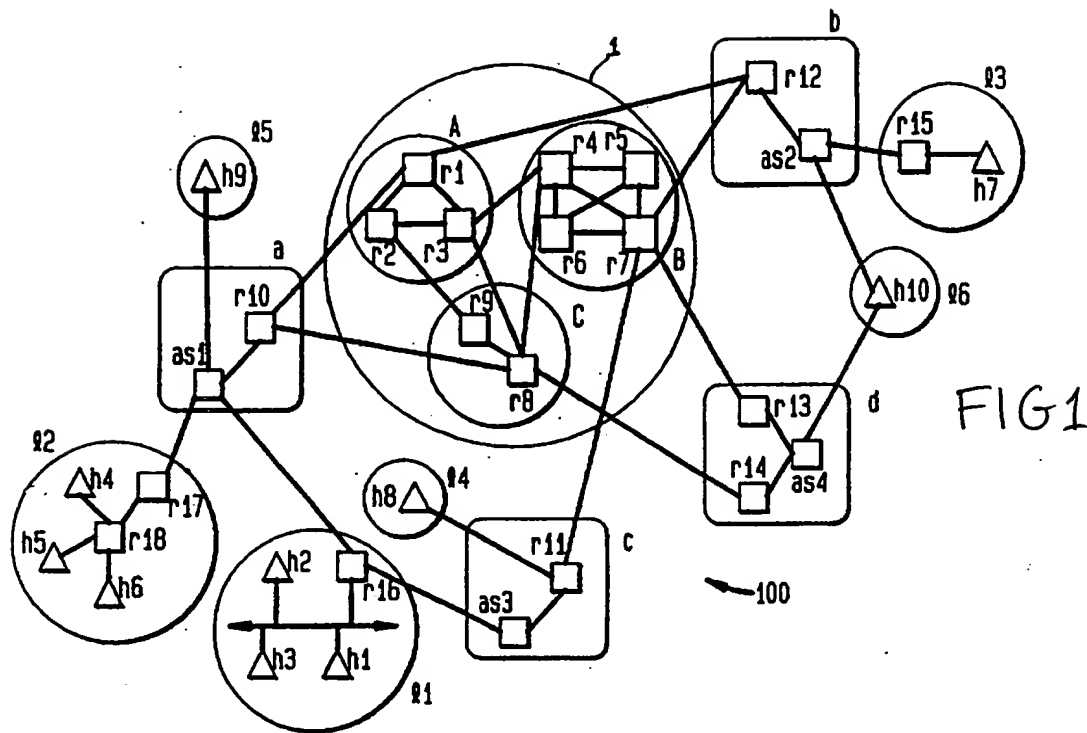


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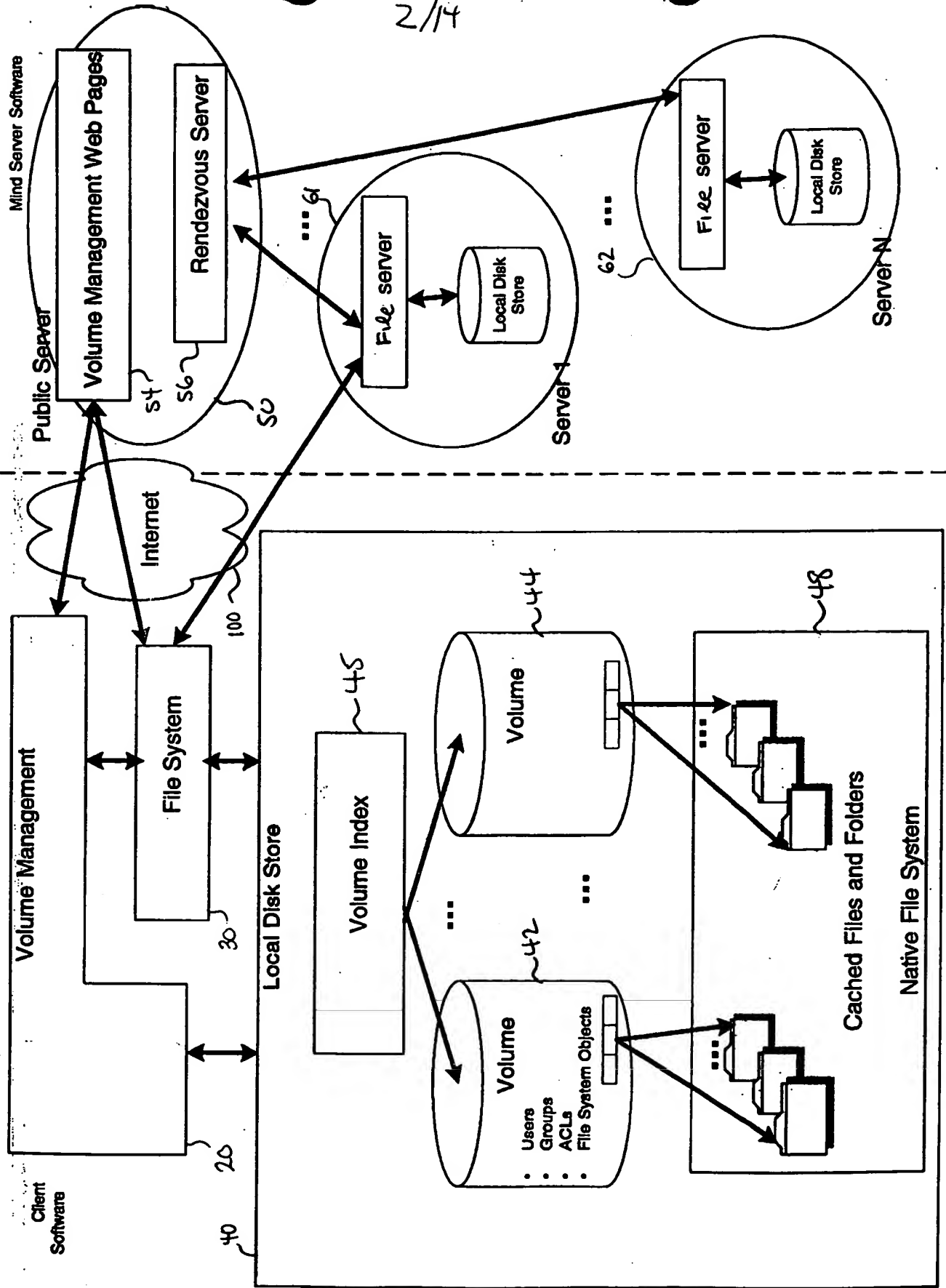
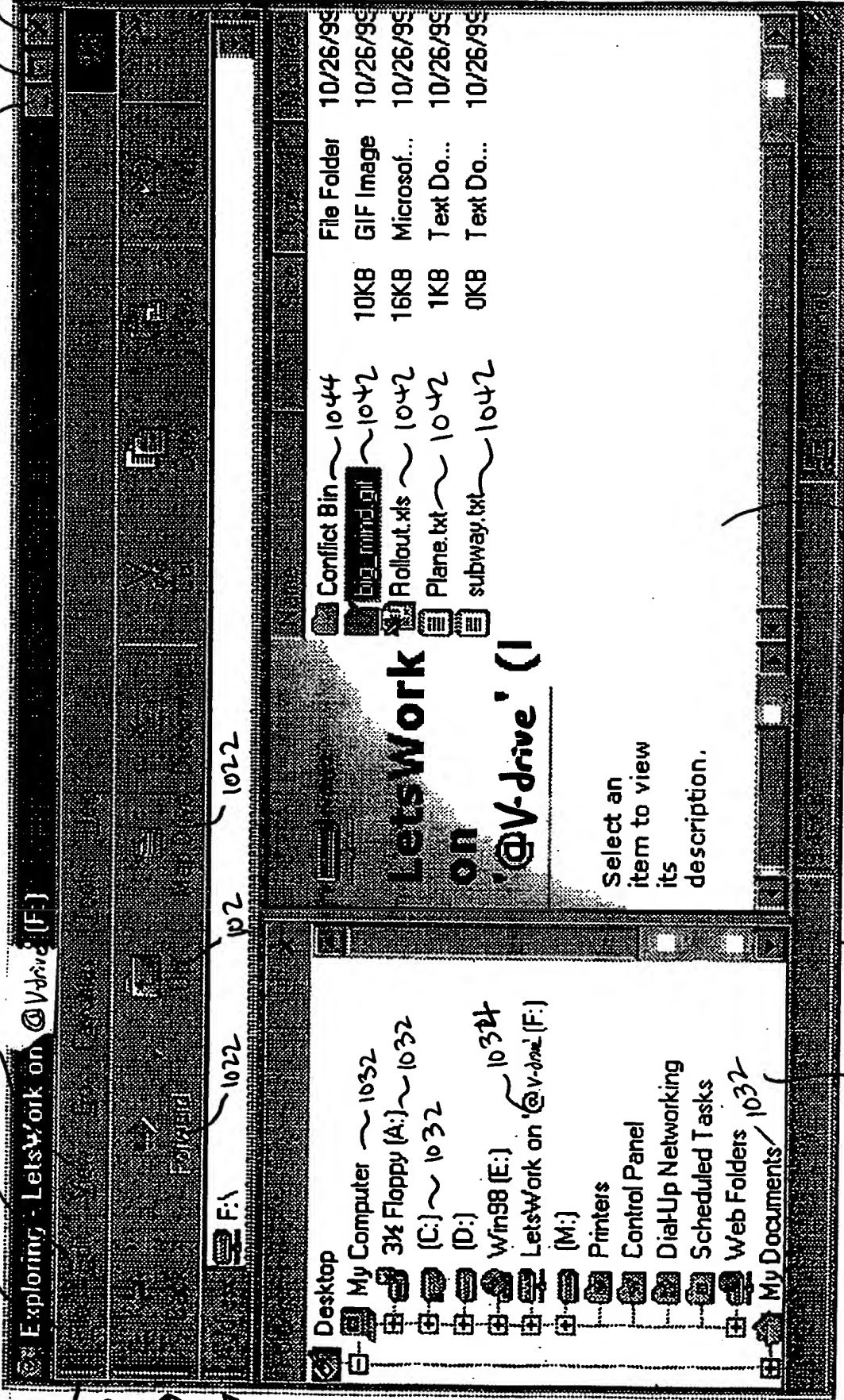


FIG 3

1010 1012 1012 1012 1002 1002

1010 1012 1012 1012



1020

1022

102

1022

1022

1022

1022

1000

1030

1040

FIG 4

Invite Process

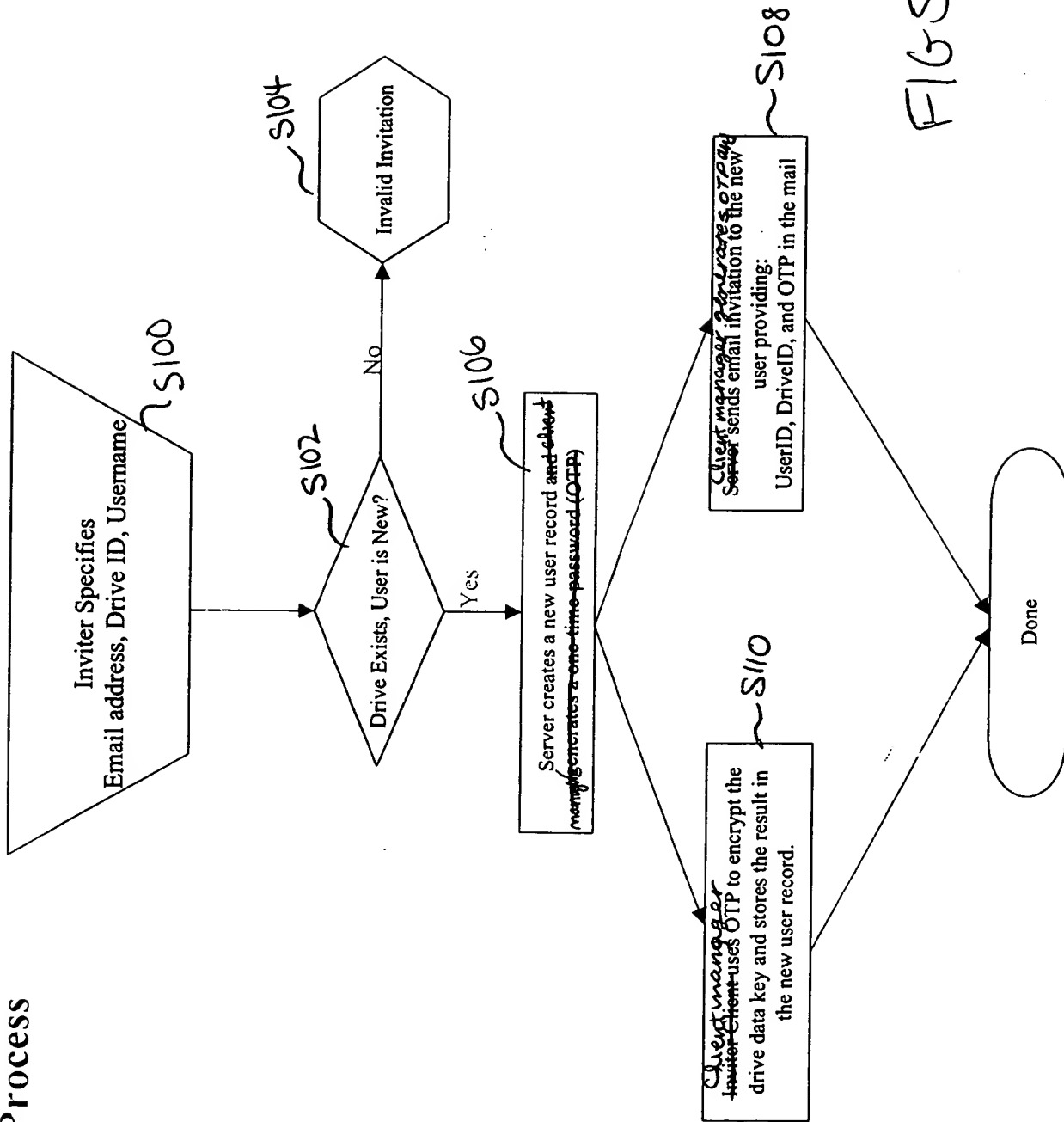


FIG 5

Join Process

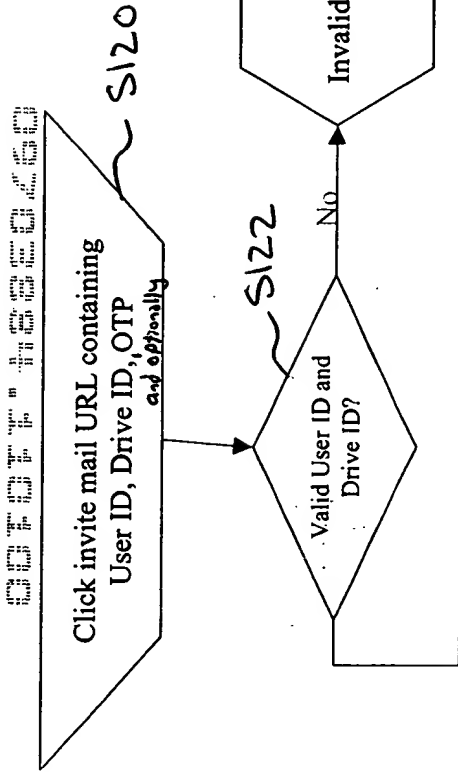
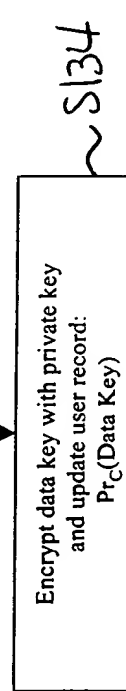
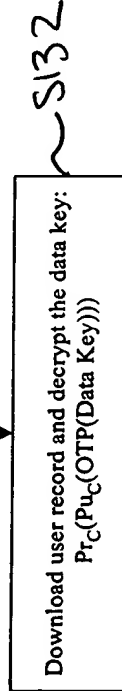
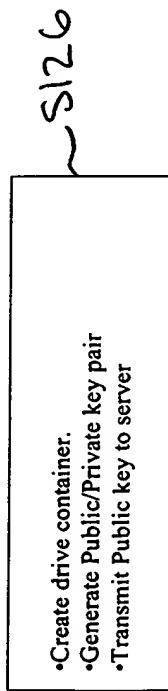
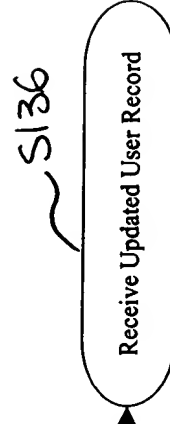
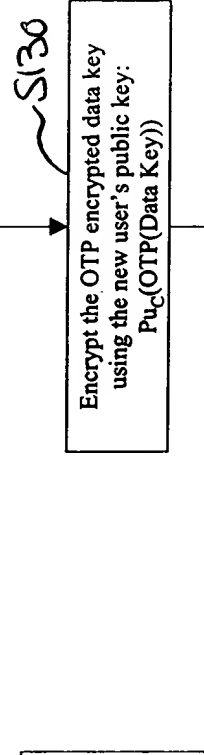
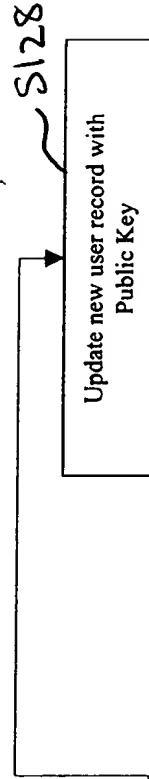


FIG 6A

Client Side



Server Side



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2Phase Join Process

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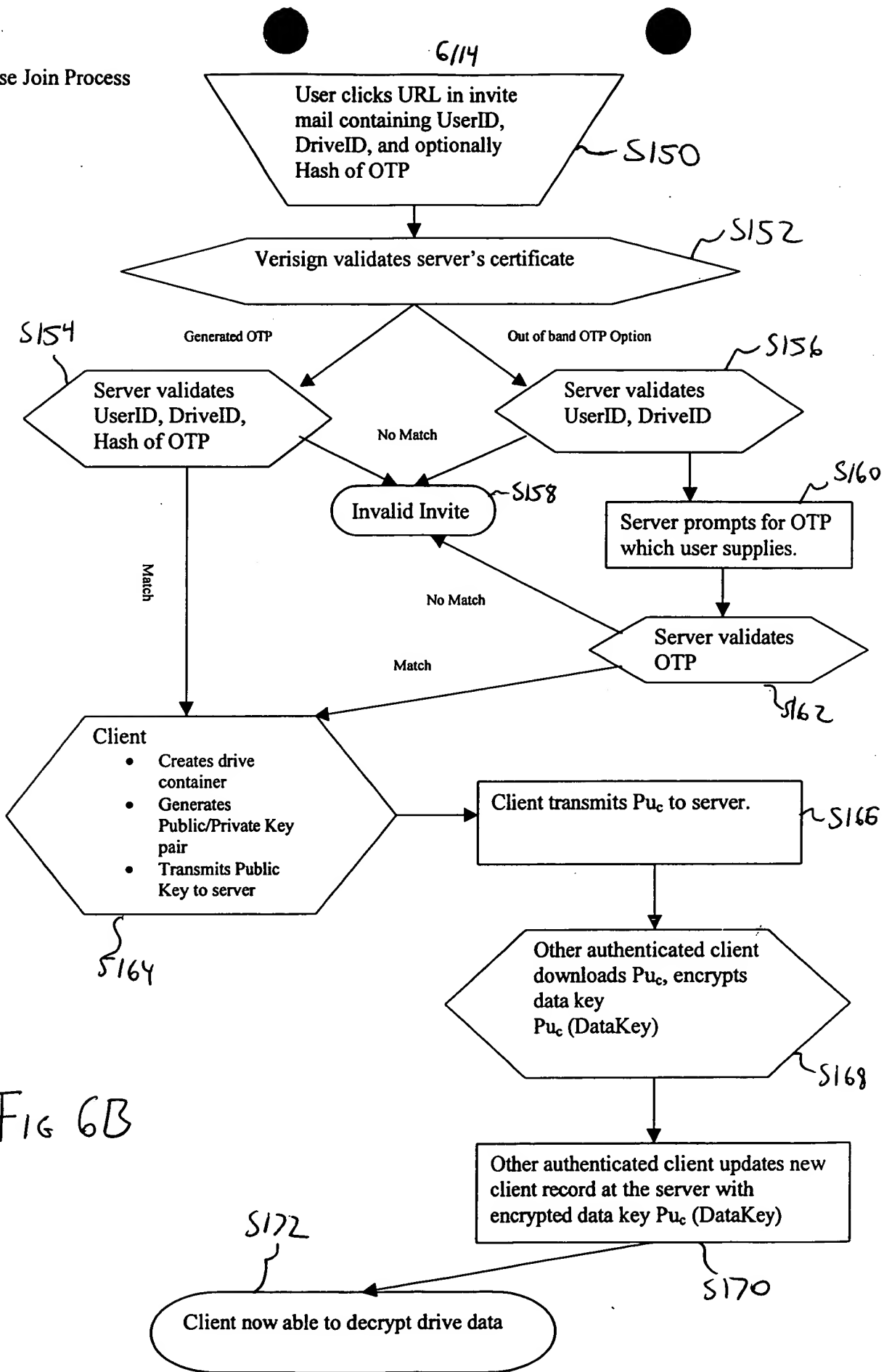
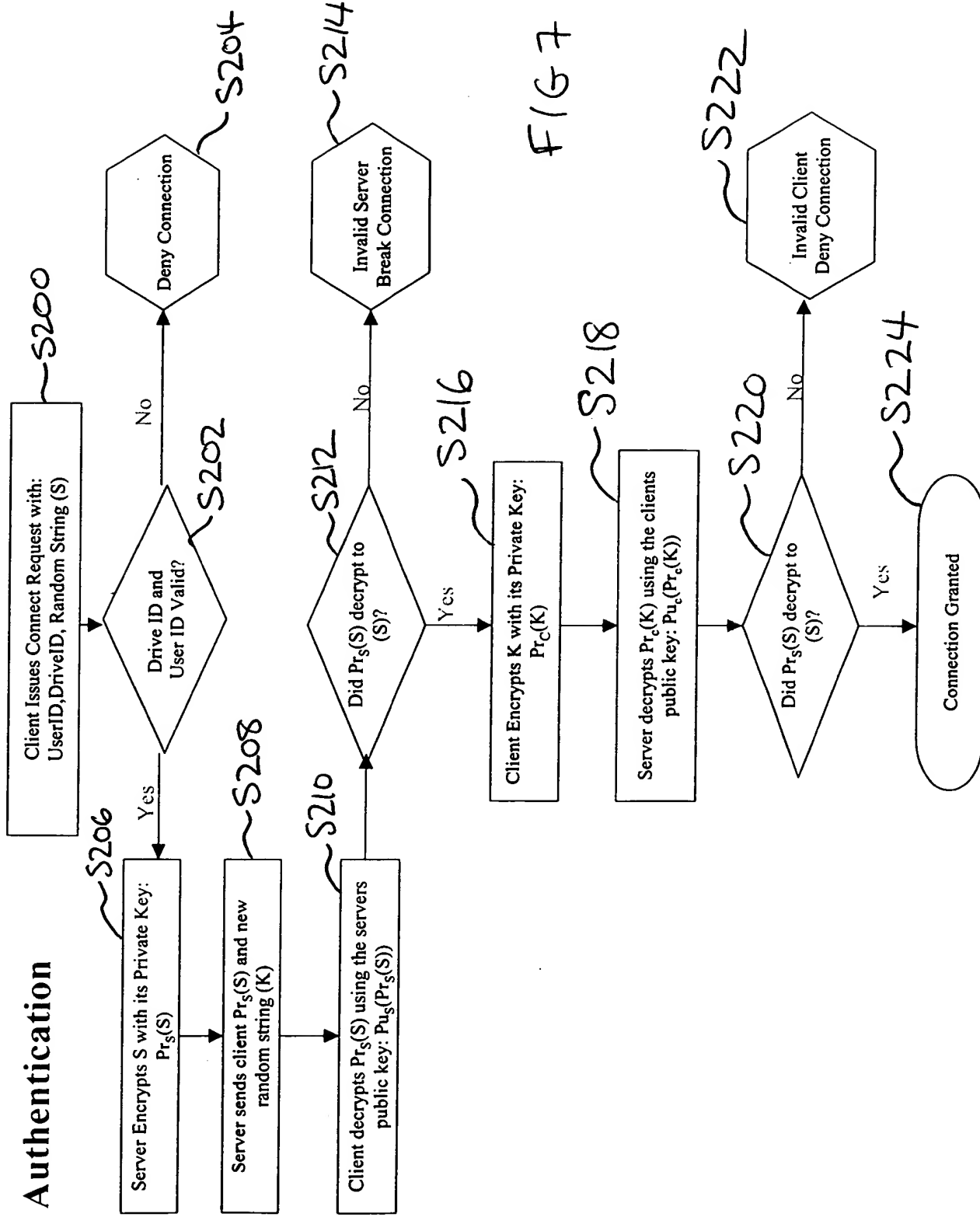


FIG 6B

Authentication



File Upload Process

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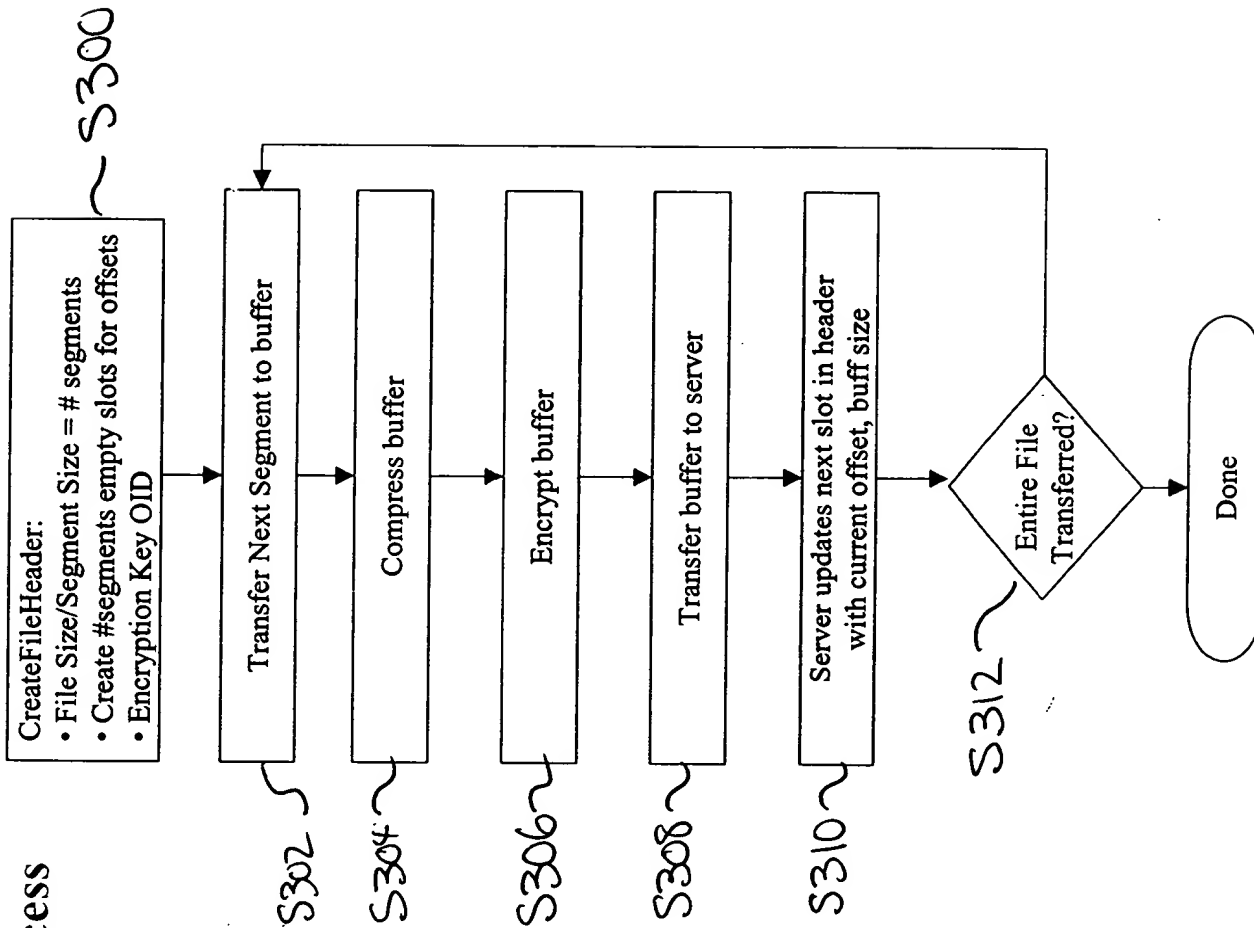
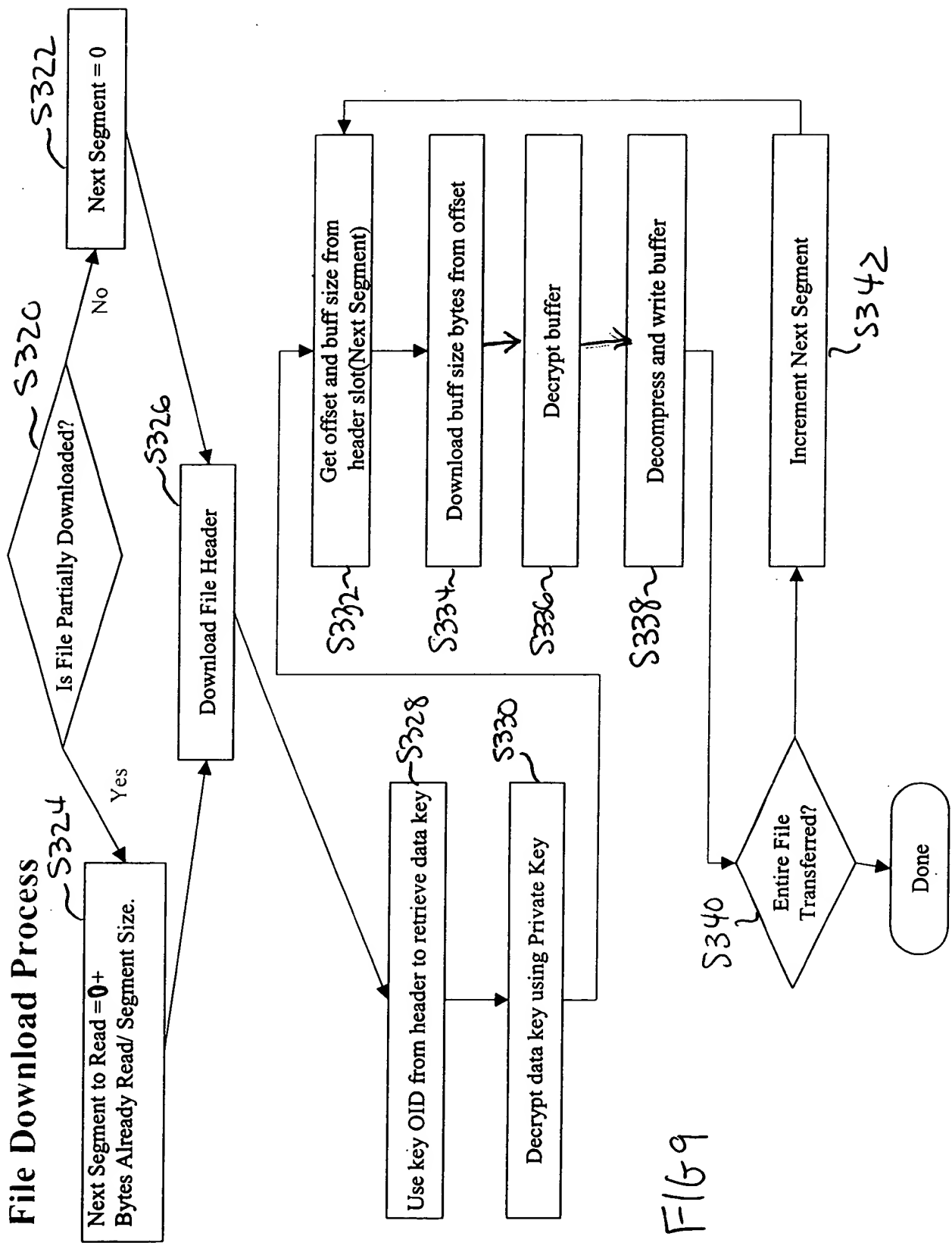


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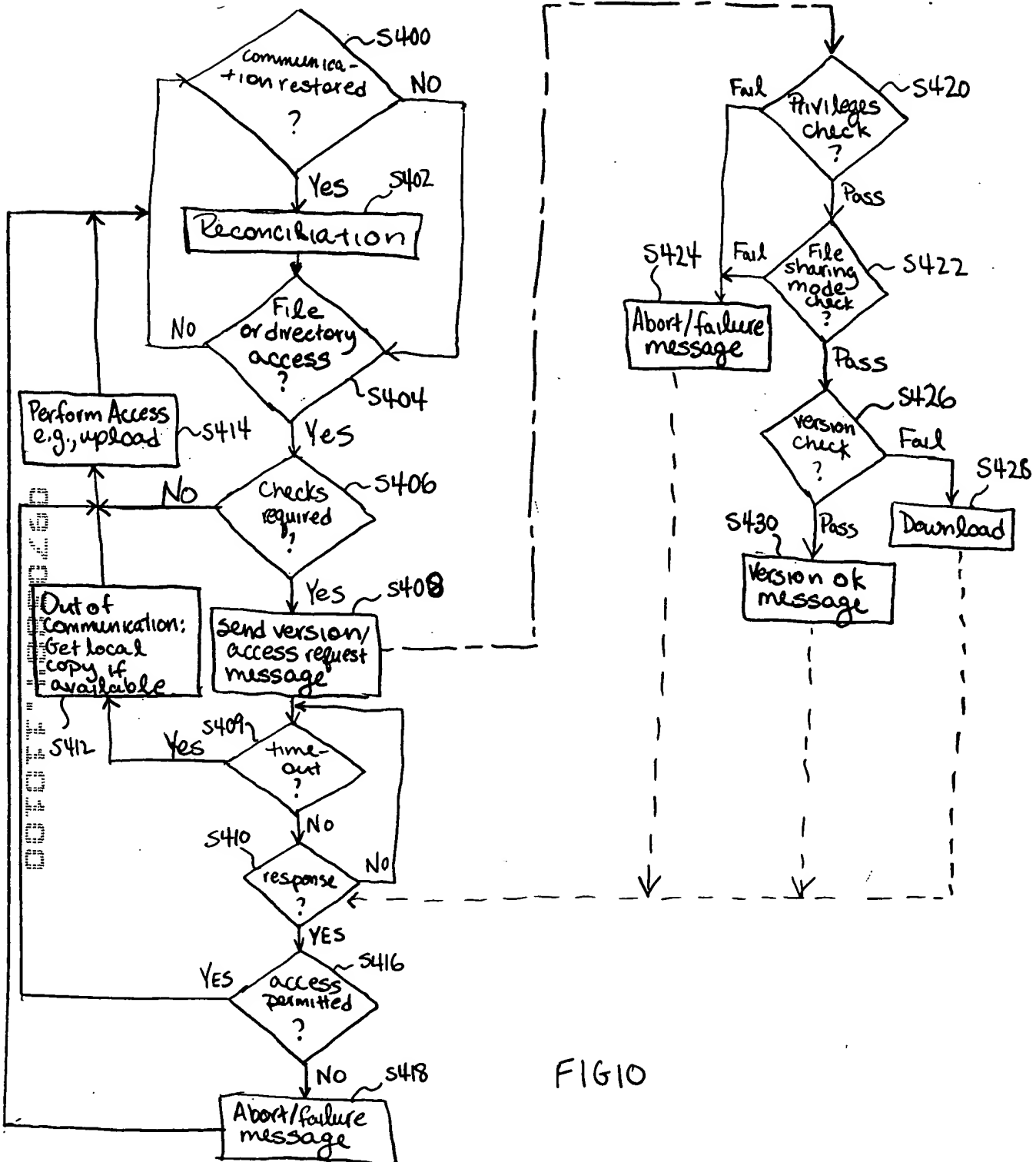


FIG 10

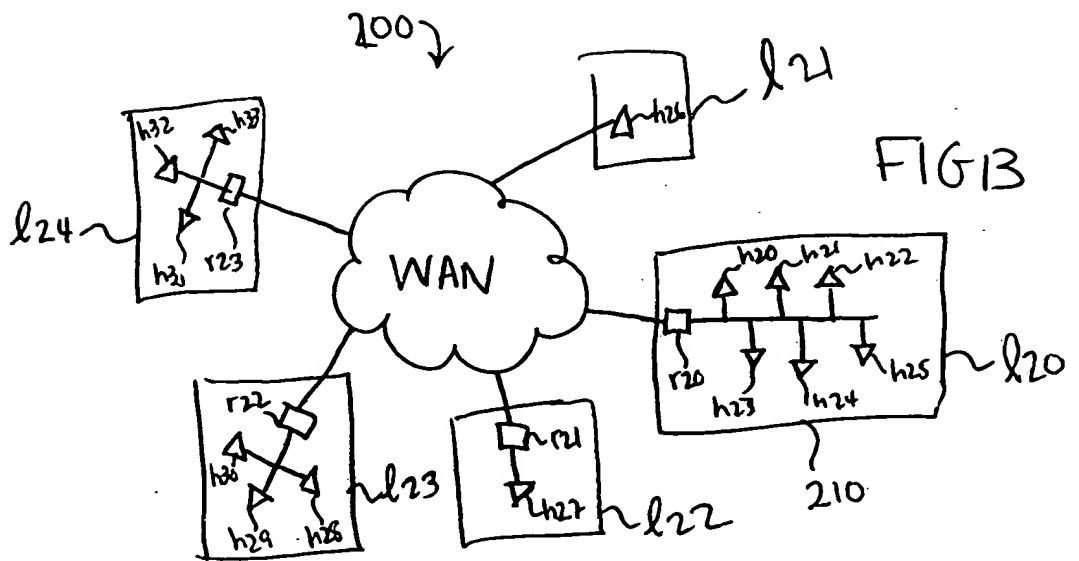
FIG 11

		C1 ₁	C2 ₁	C3 ₁	C4 ₁	C5 ₁
		File unchanged	File changed	File renamed or moved	File deleted	File's directory deleted
R1 ₁	File unchanged	No action	Invalidate local file	Rename or move locally cached file	Delete locally cached file	Delete locally cached file
R2 ₁	File changed	Upload client file	Move client file to the Conflict Bin & invalidate local file	Move client file to the Conflict Bin & upload it	Move client file to the Conflict Bin & upload it	Move client file to the Conflict Bin & upload it
R3 ₁	File renamed or moved	Rename or move file at server	Move server file to the Conflict Bin	Put warning in Conflict Bin (unless identical rename/move)	Move file to the Conflict Bin & upload file	Move client file to the Conflict Bin & upload it
R4 ₁	File deleted	Delete file at server	Move server file to the Conflict Bin	Ignore delete; put warning in Conflict Bin	No action	No action
R5 ₁	File's directory deleted	Delete file at server	Move server file to the Conflict Bin	Move server file to the Conflict Bin & download it	No action	No action

FIG 12

FIG 12		C1'	C2'	C3'	C4'	C5'
		Directory unchanged	Directory attribute changed	Added child file or directory	Directory renamed or moved	Directory deleted
R1'	Directory unchanged	No action	Download changed attribute	Download new dir entry	Rename or move locally cached directory	Delete locally cached directory
R2'	Directory attribute changed	Upload changed attribute	Put warning in Conflict Bin and keep server attribute or later timestamp	Download new dir entry	Rename or move locally cached directory; upload change	Delete locally cached directory
R3'	Added child file or directory	Upload new dir entry	If compatible, upload dir entry & download attr change. Else move new local entry to Conflict Bin.	If compatible, upload & download dir entry changes. Else move new local entry to Conflict Bin.	Rename or move local directory; upload new dir entry	Move new file/dir to Conflict Bin; delete local directory
R4'	Directory renamed or moved	Rename or move directory at server	Rename or move server directory; download attr change	Rename or move directory at server; download new dir entry	Put warning in Conflict Bin (unless identical rename/move)	Put warning in Conflict Bin & upload directory
R5'	Directory deleted	Delete directory at server	Delete directory at server	Move new file/dir to Conflict Bin; delete dir at server	Put warning in Conflict Bin & download directory	No Action

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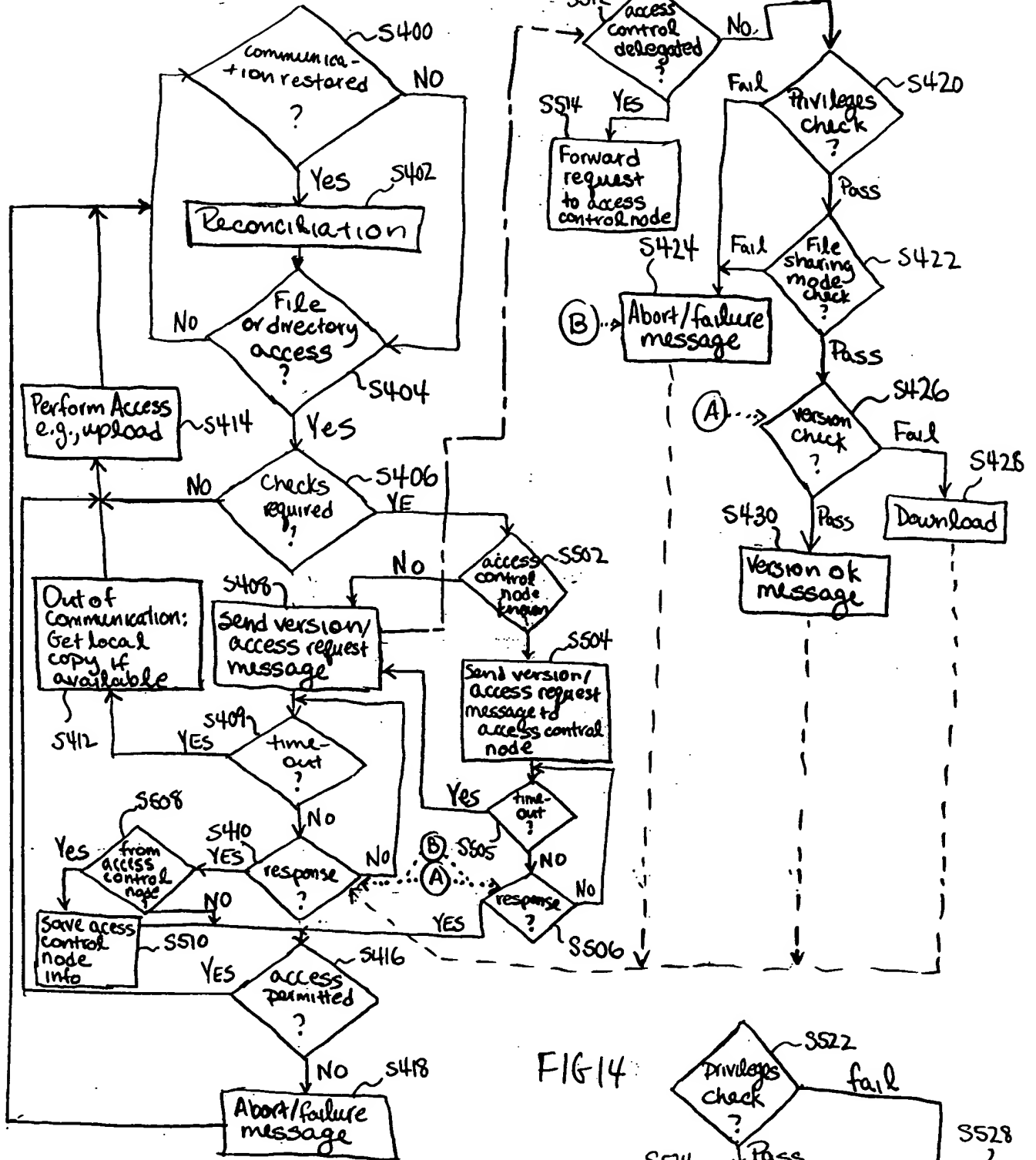


FIG 14

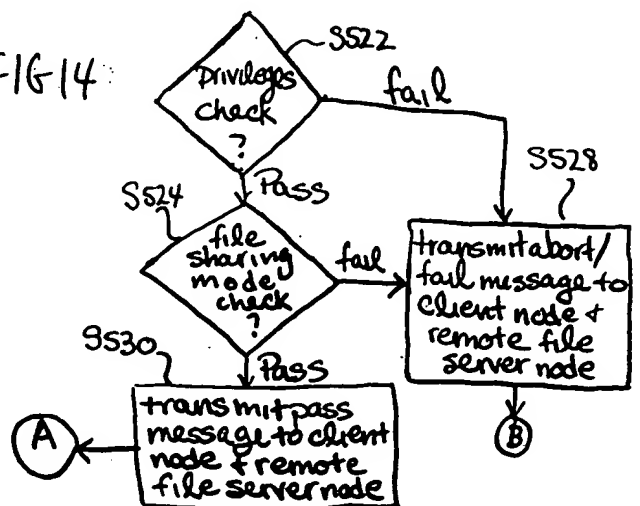


Figure 1. The effect of the number of iterations (n) on the accuracy of the proposed algorithm. The figure shows two plots side-by-side. The left plot shows the error norm $\|e\|_2$ versus n , and the right plot shows the relative error $\frac{\|e\|_2}{\|y\|_2}$ versus n . Both plots show a decreasing trend as n increases from 0 to 1000. The left plot has a logarithmic y-axis ranging from 10^{-16} to 10^0 . The right plot has a linear y-axis ranging from 0 to 0.0008. Both plots have an x-axis ranging from 0 to 1000.

